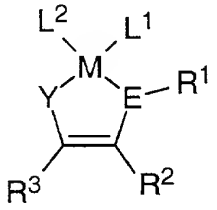
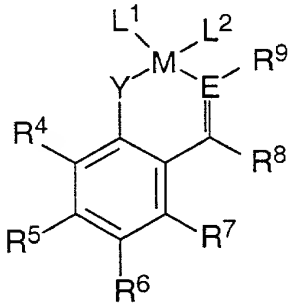
Claims

1. Process for the production of aqueous polymer dispersions by the reaction of one or more olefinically unsaturated compounds [olefin(s)] in aqueous medium in the presence of

a1) a complex compound of the general formula Ia and/or Ib



Ia



Ib

in which the substituents and indices have the following meaning:

M a transition metal of groups 7 to 10 of the periodic system of the elements,

L^1 phosphanes $(R^{16})_xPH_{3-x}$ or amines $(R^{16})_xNH_{3-x}$ having identical or different substituents R^{16}, ethers $(R^{16})_2O$, H_2O, alcohols $(R^{16})OH$, pyridine, pyridine derivatives of the formula $C_5H_{5-x}(R^{16})_xN$, CO, C_1–C_{12} alkyl nitriles, C_6–C_{14} aryl nitriles or ethylenically unsaturated double-bonded systems, x standing for an integer between 0 and 3,

L^2 halide ions, amide ions $(R^{16})_hNH_{2-h}$, h standing for an integer between 0 and 2, and furthermore C_1–C_6 alkyl anions, allyl anions, benzyl anions or aryl anions,

wherein L^1 and L^2 can be linked to one another by means of one or more covalent bonds,

E nitrogen,

Y oxygen, sulfur, N–R^{10} or P–R^{10},

R^1 hydrogen, C_1-C_{12} alkyl groups, C_7-C_{13} aralkyl substituents or C_6-C_{14} aryl groups,

R^2, R^3 independently of one another
hydrogen,
C_1-C_{12} alkyl, wherein the alkyl groups can be branched or unbranched,
C_1-C_{12} alkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,
C_7-C_{13} aralkyl,
C_3-C_{12} cycloalkyl,
C_3-C_{12} cycloalkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,
C_6-C_{14} aryl,
C_6-C_{14} aryl, identically or differently substituted by one or more C_1-C_{12} alkyl groups, halogens, singly or multiply halogenated C_1-C_{12} alkyl groups, C_1-C_{12} alkoxy groups, silyloxy groups $OSiR^{11}R^{12}R^{13}$, amino groups $NR^{14}R^{15}$ or C_1-C_{12} thioether groups,
C_1-C_{12} alkoxy groups,
silyloxy groups $OSiR^{11}R^{12}R^{13}$,
halogens or
amino groups $NR^{14}R^{15}$,
wherein the substituents R^2 and R^3 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^4 to R^7 independently of one another
hydrogen,
C_1-C_{12} alkyl, wherein the alkyl groups can be branched or unbranched,
C_1-C_{12} alkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,
C_7-C_{13} aralkyl,
C_3-C_{12} cycloalkyl,
C_3-C_{12} cycloalkyl, singly or multiply substituted by identical or different C_1-C_{12} alkyl groups, halogens, C_1-C_{12} alkoxy groups or C_1-C_{12} thioether groups,
C_6-C_{14} aryl,

C_6-C_{14} aryl, identically or differently substituted by one or more C_1-C_{12} alkyl groups, halogens, singly or multiply halogenated C_1-C_{12} alkyl groups, C_1-C_{12} alkoxy groups, silyloxy groups $OSiR^{11}R^{12}R^{13}$, amino groups $NR^{14}R^{15}$ or C_1-C_{12} thioether groups,
C_1-C_{12} alkoxy groups,
silyloxy groups $OSiR^{11}R^{12}R^{13}$,
halogens,
NO_2 groups or
amino groups $NR^{14}R^{15}$,
wherein pairs of neighboring substituents R^4 to R^7 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^8, R^9 independently of one another
hydrogen,
C_1-C_6 alkyl groups,
C_7-C_{13} aralkyl substituents or
C_6-C_{14} aryl groups, optionally substituted by one or more C_1-C_{12} alkyl groups, halogens, singly or multiply halogenated C_1-C_{12} alkyl groups, C_1-C_{12} alkoxy groups, silyloxy groups $OSiR^{11}R^{12}R^{13}$, amino groups $NR^{14}R^{15}$ or C_1-C_{12} thioether groups,

R^{10} to R^{15} independently of one another
hydrogen,
C_1-C_{20} alkyl groups, which on their part may be substituted by $O(C_1$-C_6 alkyl) or $N(C_1$-C_6 alkyl)$_2$ groups,
C_3-C_{12} cycloalkyl groups,
C_7-C_{13} aralkyl substituents or C_6-C_{14} aryl groups,

R^{16} hydrogen,
C_1-C_{20} alkyl groups, which for their part may be substituted by $O(C_1$-C_6 alkyl) or $N(C_1$-C_6 alkyl)$_2$ groups,
C_3-C_{12} cycloalkyl groups,
C_7-C_{13} aralkyl substituents or C_6-C_{14} aryl groups,

b) dispersing agents and optionally

c) organic solvents having low solubility in water,

d) the metal complexes a1) being dissolved in a portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water and

e) the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which holds the metal complexes a1) in solution being present in the aqueous medium as a dispersed phase having an average droplet diameter $\leq$ 1,000 nm.

2. Process as claimed in claim 1, wherein the metal complex a1) is used in combination with an activator a2).

3. Process as claimed in any of claims 1 or 2, wherein an electrically neutral nickel complex compound is used as the complex compound of the general formula I a and/or I b.

4. Process as claimed in any of claims 2 or 3, wherein the activator a2) is an olefin complex of rhodium or nickel.

5. Process as claimed in any of claims 1 to 4, wherein ethylene is used exclusively as olefin.

6. Process as claimed in any of claims 1 to 4, wherein at least two olefins selected from the group comprising ethylene, propylene, 1-butene, 1-hexene and styrene are used.

7. Process as claimed in claim 6, wherein ethylene is used in combination with propylene, 1-butene, 1-hexene or styrene.

8. Process as claimed in any of claims 1 to 7, wherein anionic, cationic and/or nonionic emulsifiers are employed as the dispersing agents b).

9. Process as claimed in any of claims 1 to 8, wherein aliphatic and aromatic hydrocarbons, fatty alcohols and/or fatty acid esters are used as the organic solvents c).

10. Process as claimed in any of claims 1 to 9, wherein the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which contains the metal complexes a1) in solution and which is present in the aqueous medium as a dis-

perse phase having an average droplet diameter ≤ 1,000 nm contains further components.

11. Aqueous polymer dispersion prepared by a process as claimed in any of claims 1 to 10.

12. Use of an aqueous copolymer dispersion as claimed in claim 11 as binding agent in adhesives, sealing compounds, plastic plasters and surface coatings.